IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Olson et al.	)Att. ref.:29143-80
Serial No.:	10/556,236	)Examiner: Qian
Filing Date:	11/8/2005	)Art Unit: 1793
Title:	IMPROVED FINE PORE MEDIA AND METHOD FOR MAKING SAME	)Conf. No.: 3702

DECLARATION UNDER 37 CFR § 1.132

I, Rudolph A. Olson III, Ph.D. declare as follows:

1. That I obtained a Bachelor of Science Degree in Ceramic Engineering from the University of Illinois in 1992.

2. That I obtained a Master of Science Degree in Material Science from Northwestern University in 1994.

3. That I obtained a Doctorate in Philosophy Degree in Material Science from Northwestern University in 1998.

4. That I was hired by Selee Corporation, a subsidiary of Porvair PLC in August 1999 as a Research Engineer.

5. That I am a co-inventor of U.S. Pat. Appl. No. 10/556,236 filed 11/8/2005.

6. That I have read and am familiar with U.S. Pat. Appl. No. 10/556,236 filed 11/8/2005(hereinafter the '236 Application).

7. That I have read and understand U.S. Patent No. 4,839,049 to Kinney et al. (hereinafter "Kinney").

8. That I have read and understand U.S. Patent No. 3,893,917 to Pryor et al. (hereinafter "Pryor").

9. That I have executed, or have had executed under my direction, experiments which substantially duplicated the slurry described in Example III of Kinney.

10. That in the duplicate of Example III of Kinney a 3000 gram compositional batch was prepared with the compositional components listed in Table 1 wherein the components were mixed in accordance with Example III of Kinney.

11. That in the components listed in Table 1 all three alumina powders were 99+% pure low sodium with particle sizes similar to those of listed in Table B of Kinney with each having a d_{50}

particle size near 1 micron; zirconia was S-grade from Magnesium Elektron with a d_{50} of about 10 microns and a near -325 mesh grade; the calcined fiberous aluminum-silicate was Pyrolog fiber from Thermal Ceramics; the 13% polyvinyl alcohol solution was prepared by diluting a 21% polyvinyl alcohol solution with water.

12. That a Hobart mixer was charged with the 330 grams of hot distilled water, 555 grams of 13% polyvinyl alcohol solution and 0.5% polyglycol blended for five minutes with titanium oxide and manganese oxide added to the liquid batch during mixing and the powder batch was gradually added to prevent agglomerate formation after which the mixture was ball-milled for three hours using ¼ and ½ inch alumina media filling 40% of the ball-mill volume yielding a slurry with a viscosity and texture similar to paint.

13. That the slurry was impregnated into 30 ppi polyurethane foam strips with each having a cross-sectional area of approximately 0.55 x 0.85 inches after which the strips were dried overnight.

14. That the slurry was attempted to be impregnated into 60 ppi polyurethane foam strips with each having a cross-sectional area of approximately 0.55 x 0.85 inches, in the same manner as the impregnation of the 30 ppi strips, after which the strips were dried overnight.

15. That after drying the strips were photographed.

16. That a photo of the impregnated 30 ppi foam is shown herein as Figure 1.

17. That a photo of the 60 ppi foam treated with slurry in a the same manner as the 30 ppi foam is shown herein as Figure 2.

18. That close-up photos of the 30 ppi impregnated foam and 60 ppi foam treated in the same manner are provided in Figures 3 and 4 respectively.

19. That the photos of the impregnated 30 ppi foam show a homogeneous material.

20. That the photos of the 60 ppi foam treated in the same manner show slurry separated randomly at the surface of the foam indicating that the slurry was breaking down at the surface of the foam.

21. That the slurry did not adequately penetrate the 60 ppi foam.

22. That a slurry which does not adequately penetrate a foam yields a density which is higher towards the exterior and lower towards the interior.

23. That based on the results presented the slurry of Kinney will not form a suitable impregnated organic foam with a pore size equal to or less than 60 ppi.

24. That the samples were fired at 2900°F after which the compressive strength was measured using an Instron model 4206 with a cross-head speed of 0.2 in/min with the results presented in Table 2 for the 30 ppi samples and Table 3 for the 60 ppi samples.

25. That the 60 ppi foam prepared using the slurry of Kinney was very friable due to poor impregnation.

26. That the 60 ppi foam prepared using the slurry of Kinney would not be acceptable for use for filtering molten metal due to structural weakness and poor filtration.

27. That one of skill in the art could not achieve an adequate fine pore filter as set forth in claim 10 of the '236 Application from the teachings of Kinney.

28. That one of skill in the art could not achieve an adequate filter for filtering impurities from molten metal as set forth in claim 12 of the '236 Application from the teachings of Kinney.

29. That all statements made herein are, to my knowledge, true and that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code, and that willful false statements may jeopardize the validity of any United States Patent issuing on the present Application.

Rudolph A. Olson, III

Date: 12-17-09.

Table 1: Composition of Alumina Slurry in Accordance with Example III of Kinney

	Weight Fraction	Grams
A16 alumina	10.9	327
P172SB alumina	37.7	1131
A1000 alumina	8.3	249
S-grade zirconium oxide	10.0	300
titanium oxide	0.25	7.5
manganese oxide	0.25	7.5
aluminosilicate fiber	3.0	90
13% PVA solution	18.5	555
Water	11	330
Polyvinyl glycol	0.5	15

Table 2: Compressive Yield Strengths for 30 ppi Sample

30-ppi Sample number	WEIGHT grams	Density %	Pk Load lbs	Cross-sectional area (sq in)	compressive Strength (psi)
1	6.12	10.35	332.6	2.09	159
2	6.12	10.49	299.2	2.08	144
3	5.41	9.00	242	2.13	114
4	5.67	9.72	288.9	2.09	138
5	6.63	10.93	422.4	2.13	198
6	9.98	16.94	883.2	2.09	423
7	6.17	10.36	308.1	2.14	144
8	10.54	16.61	910.1	2.15	424
9	8.83	14.83	587.1	2.12	276
10	6.21	10.19	179.5	2.16	83
11	6.54	10.64	129.7	2.19	59
12	5.36	9.25	164	2.06	80
13	5.65	9.10	162.3	2.14	76
14	9.4	15.73	684.3	2.10	325
15	5.5	8.99	136.2	2.18	62
16	5.33	8.85	137.9	2.09	66
17	5.54	8.77	146.8	2.12	69
18	6.95	11.58	370.3	2.15	172
19	4.8	8.00	214.8	2.12	101
20	10.49	17.63	911.1	2.09	437

Table 3: Compressive Yield Strengths for 60 ppi Sample

60-ppi Sample number	WEIGHT grams	Density %	Pk Load lbs	Cross-sectional area (sq in)	compressive Strength (psi)
1	6.95	9.66	192.6	2.24	86
2	6.31	9.49	111.8	2.32	48
3	7.57	10.24	276.9	2.28	122
4	6.24	8.29	148.5	2.46	60
5	8.81	12.49	325.6	2.32	141
6	8.15	11.88	199.2	2.26	88
7	10.83	14.51	337.2	2.31	146
8	6.56	8.25	119.6	2.36	51
9	9.11	12.78	239.1	2.25	106
10	8.24	12.05	293.4	2.24	131
11	10.09	13.95	365.2	2.26	162
12	7.88	11.51	265.2	2.24	118
13	7.58	10.61	166	2.30	72
14	10.38	13.97	Did not test	2.30	
15	7.81	11.69	330.6	2.27	146
16	9.23	13.82	291.8	2.27	128
17	6.52	8.70	220	2.36	93
18	6.24	8.72	148.2	2.31	64
19	8.23	11.88	232.2	2.22	105
20	10.56	14.56	283.2	2.24	127

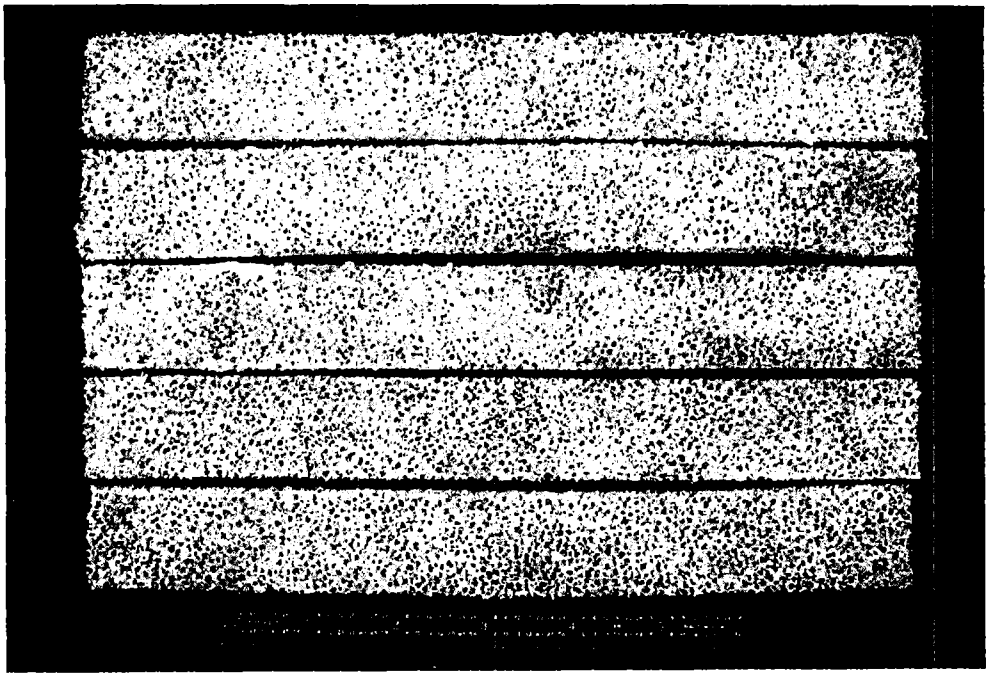

Figure 1: Strips of green impregnated 30-ppi samples.

Figure 2: Strips of green impregnated 60-ppi samples.

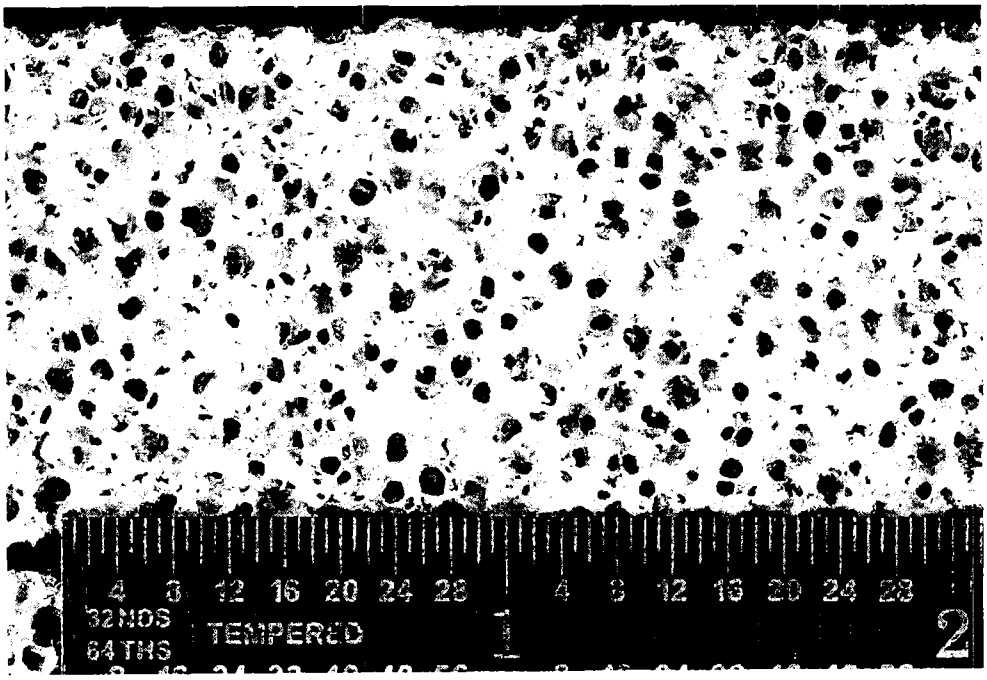

Figure 3: Close-up of green impregnated 30-ppi samples.

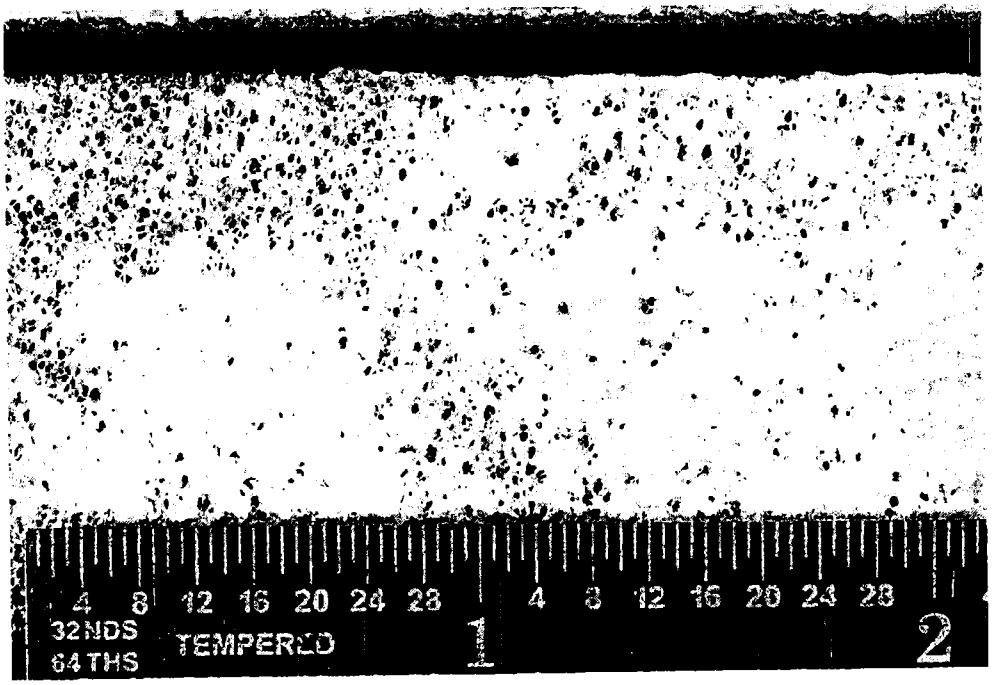

Figure 4. Close-up of green impregnated 60-ppi samples.